

Claims:

1. An expanded polystyrene particle with a functional skin layer consisting of an inner expanded polystyrene layer and a functional skin layer wherein the inner expanded polystyrene layer is formed by heating and expanding an expandable polystyrene bead or pellet, and the functional skin layer is formed by coating the surface of the inner expanded polystyrene layer with a functional coating composition containing 10~99 wt% of a vinyl acetate based polymer and 0.1~90 wt% of at least one functional additive.
2. The expanded polystyrene particle with functional skin layer according to claim 1, wherein the vinyl acetate based polymer is a vinylacetate homopolymer, or a copolymer of vinyl acetate and at least one monomer selected from: vinyl esters, such as vinyl caproate and vinyl stearate; acrylic esters, such as ethyl acrylate, butyl acrylate and octyl acrylate; fumaric acid esters, such as dibutyl maleate; carboxylic acids, such as maleic acid, acrylic acids and itaconic acid; vinyl alcohols; butadienes; and caprolactones; or a mixture or a blend thereof, and has a degree of polymerization (DP) of 10~100,000.
3. The expanded polystyrene particle with functional skin layer according to claim 1, wherein the functional skin layer has a thickness corresponding to 0.003~10% of the overall diameter of the particle, and makes up 1~95 wt% based on the total weight of the particle.
4. The expanded polystyrene particle according to claim 1, wherein the functional additive is selected from expanding agents, nucleating agents, lubricants, antioxidants, heat stabilizers, ultraviolet stabilizers, biostabilizers, fillers, reinforcing agents, plasticizers, colorants, impact-resistant agents, flame retardants, antistatic agents, crosslinking agents, fluorescent whitening agents, thermal conductivity-imparting agents, electrical conductivity-imparting agents, permeability modifiers, magnetism-imparting agents, surfactants, stabilizers, excipients, drugs, solvents, hardeners, desiccants, fortifying agents, flavoring agents, antibacterial agents, and mixtures thereof.
5. A functional expanded polystyrene molded product manufactured by molding the expanded polystyrene particle with functional skin layer according to any one of claims 1 to 4.
6. A process for producing expanded polystyrene particles with functional

skin layer, comprising the steps of:

heating and expanding expandable polystyrene beads or pellets to produce expanded polystyrene particles;

5 applying a functional coating composition to the surface of the above expanded polystyrene particles, the functional coating composition being prepared by mixing or dissolving at least one functional additive with a vinyl acetate based polymer solution to form a functional skin layer; and

10 adding a release agent to the expanded polystyrene particles whose surface is coated with the functional coating composition, to separate the expanded polystyrene particles having the functional skin layer into individual particles, and drying the separated particles.

15 7. The process according to claim 6, wherein the solvent used to prepare the vinyl acetate based polymer solution is water, or an organic solvent selected from alcohols, esters, ketones, carboxylic acids, aromatics, and halogenated hydrocarbons, or mixtures thereof.

20 8. The process according to claim 6, wherein the vinyl acetate based polymer solution contains 3~80 wt% of a vinyl acetate based polymer.

25 9. The process according to claim 6, wherein the release agent is selected from hydrophilic liquid materials containing two or more hydroxyl groups (-OH) in their molecular structure, such as water, ethylene glycol and glycerin, and silicone oils, and mixtures thereof.

30 10. A process for manufacturing a functional expanded polystyrene molded product, comprising the steps of: introducing the expanded polystyrene particles with functional skin layer produced by the process according to any one of claims 6 to 9 into a steam molder; and applying high-pressure steam to the molder to bond the expanded polystyrene particles with functional skin layer to each other through their functional skin layer, followed by cooling.